GROUND WATER POLLUTANTS: NITRATE

What does the indicator tell us?

Nitrate is the most widespread agricultural contaminant and is a human health concern since it can cause methemoglobinemia, or "blue-baby syndrome." Nitrate is also an environmental concern as a potential source of nutrient enrichment of coastal waters. High levels of nitrate in well water typically indicate that pollution is seeping in from septic tanks, animal wastes, fertilizers, municipal landfills, or other nonpoint sources. The Safe Drinking Water Act requires that EPA establish federal safety standards that limit the allowable levels of nitrate in water. This level is established at 10 milligrams per liter (mg/L).

This indicator uses information from the 1990 National Pesticides Survey to demonstrate the number of people exposed to nitrate concentrations above the EPA maximum contaminant level. The survey offers the first national look at pesticide and nitrate contamination in rural domestic wells and community drinking water systems. The survey indicates that 4.5 million people were potentially exposed to elevated levels of nitrate from drinking water wells.

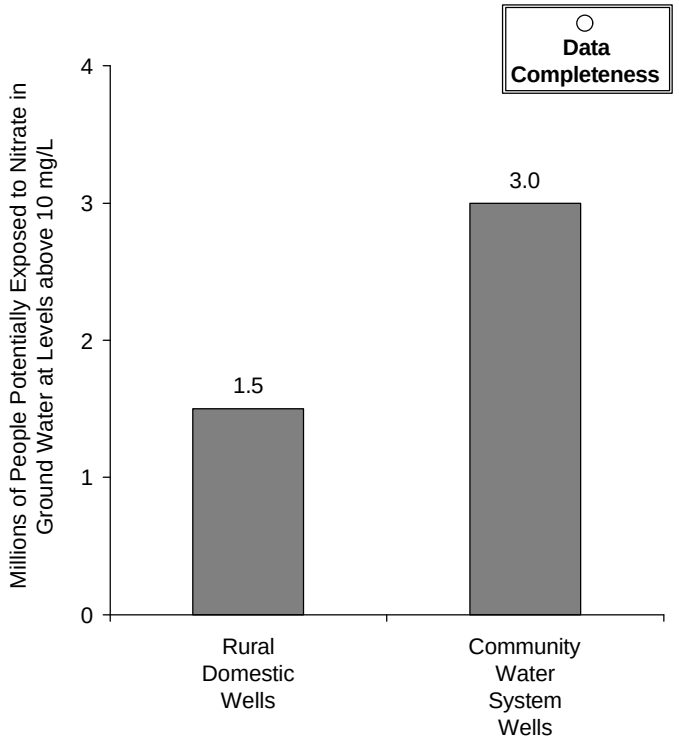
How will the indicator be used to track progress?

Most ground water studies use nitrate as an indicator because of its stability and solubility in water. Therefore, comparisons between nitrate concentrations can be made across many of these studies. It is also convenient to use nitrate concentration to track changes in ground water quality because it is a primary health-based drinking water standard. The lack of ambient ground water monitoring networks, however, hampers the tracking of any definitive trends on a national basis.

EPA will continue to review and analyze the data from public drinking water programs. It will also investigate the many studies conducted by the U.S. Geological Survey (USGS), other federal agencies, states, and local authorities that apply to existing conditions and threats to the quality of ground water. Those studies on nitrate contamination, as well as studies using other contaminants (e.g., pesticides and organic compounds) as indicators of ground water quality, will be used to update this indicator.

The modernization of the Safe Drinking Water Information System (SDWIS) and water quality monitoring data from EPA's Storage and Retrieval (STORET) systems will provide additional data to track sources of ground water contamination. SDWIS provides data on how well drinking water systems are meeting safety standards.

INDICATOR 11: Ground Water Pollutants: Nitrate



Source: *National Survey of Pesticides in Drinking Water Wells,* 1990.

Proposed Milestone: By 2005, the number of Americans served by community and rural water wells containing high concentrations of nitrate, which can cause illness, will be reduced.

What is being done to improve the indicator?

Information on ground water quality is usually obtained from the monitoring of known or suspected contamination sites or from specific studies that monitor for various contaminants in limited areas. However, available data do not always provide an accurate representation of ambient ground water quality or an indication of the extent and severity of ground water contamination problems. In addition, there is considerable difficulty in using the results of ground water studies to project both the degree of contamination on a national level and decreases in the population served by contaminated systems. In the meantime, the best available source of ground water data is studies of drinking water supplies. Ultimately, however, this indicator should measure ground water quality directly. Achieving this will require the development and implementation of monitoring strategies and programs at the local, state, and regional levels.

EPA encourages states to conduct ground water monitoring and to build comprehensive monitoring programs through integration of existing efforts aimed at characterizing the overall quality of ground water resources. This will help develop a national picture of the needs and progress of ground water protection efforts. More research and development are also needed on the natural and human-induced factors affecting ground water quality and monitoring, as well as the selection of the best indicators. Agencies at all levels of government must address problems in their monitoring efforts, collect the most useful data for their own applications, and achieve the most economical use of their monitoring investment.

EPA also strongly encourages states, through the *National Water Quality Inventory* and the Intergovernmental Task Force on Monitoring Water Quality, to assess selected aquifers or hydrogeologic settings to provide a more meaningful interpretation of ground water within the states. It is anticipated that as states develop and implement ground water monitoring plans, programs, and collection mechanisms, information will become more uniform and trends in ground water quality in states, regions, and the Nation can be evaluated more reliably.

In the future, to provide a more accurate picture of overall ground water quality, this indicator might include other contaminants as well as other uses of the ground water resource.

What is being done to improve conditions measured by the indicator?

To prevent the contamination of ground water, both the Clean Water Act and the Safe Drinking Water Act, along with other federal laws, establish requirements for states and tribes to actively protect their ground water. Unfortunately, our knowledge of the extent and severity of ground water contamination is incomplete. Other than drinking water suppliers regulated by EPA, few keep detailed monitoring records. However, with more states recognizing the need to establish ambient ground water monitoring programs, drinking water data using samples from the distribution system or blended samples from various wells will be relied on less to obtain good-quality information.

The challenge for ground water includes protecting ground water—particularly wells that supply public water systems—from pollution and helping the public better understand the ways in which it becomes polluted. Much of this effort will be supported by voluntary implementation of local or regional management strategies by cooperating agencies. Expanded ambient and site-specific monitoring can target known or suspected pollution sources, yielding valuable information on ground water quality.

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